

## The Scavenging Activity of Complex Transitional Metal Flavonoid of Java Plum

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### ABSTRACT

This research is aimed to prove the ability of nano size extracted freeze-dried Java Plum Fruit (JPF) as free radical scavenger. This ability is due to their rich contained of complex transitional metal-flavonoid compounds. The experiment was done by application of the extracted freeze-dried JPF in the cigarette filter. The smoke wavelength shift in the IR spectra when compared to mainstream cigarette smoke released from a cigarette filter without JPF. The physical and chemical characteristics of the mainstream smoke were analyzed by Fourier Transform Infrared Spectroscopy (FTIR), X-Ray Diffraction (XRD) and Electron Spin Resonance (ESR). The XRD analysis of cigarette mainstream smoke of two products, one with JPF in the filter and the other one without JPF in the filter, indicated a significant difference in the resulting diffraction patterns. Additional and altered diffraction peaks were found in the spectrum of the mainstream smoke of the cigarette containing JPF in the filter. This finding suggests that JPF applied into the filter might alter the chemical properties of mainstream smoke. The result of the ESR analysis depicted that the mainstream smoke of cigarette with the JPF in the filter was less paramagnetic than the mainstream smoke from the cigarette without JPF on the filter. The factor-g value was higher (g-value: 2.0063) for the mainstream smoke of the cigarette without JPF in the filter; the lower g-value for the cigarette with JPF in the filter (g-value: 2.0048) is most likely caused by an energy splitting. Furthermore, the ESR spectra indicated a decline in the concentration of free radicals in the mainstream smoke of the cigarette with JPF in the filter. Our findings suggest that the extract of JPF applied in a cigarette filter can effectively decrease the number of free radicals in mainstream cigarette smoke.

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